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ABSTRACT

The report summarizes a 1976 conference designed to analyze the findings and recommendations of three studies of language development in young handicapped children. It is explained that project directors and language researchers attended the Bureau of Education for the Handicapped - sponsored conference. A summary of conference discussion is presented on the findings and recommendations from a Boston University study on assessment instruments; a University of Kansas study on the assessment of language-related skills of pre-linguistic children, and establishment of a computer based storage and retrieval system for language literature; and a study at George Peabody College of a model of valid language approaches for clinicians. Suggestions regarding areas of future research, methodologies, and procedures are discussed regarding three areas: language acquisition and care-giver/child interactions, intervention strategies with handicapped children, and design of assessment instruments and procedures. (CL)

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A SUMMARY OF A CONFERENCE TO ANALYZE LANGUAGE REVIEW FINDINGS

A FINAL REPORT OF A DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE CONFERENCE CONDUCTED BY THE U. S. OFFICE OF EDUCATION, BUREAU OF EDUCATION FOR THE HANDICAPPED

UNDER CONTRACT NO. 300-76-0561

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I. INTRODUCTION

In 1974, the Bureau of Education for the Handicapped awarded three contracts to review and analyze available information and resources pertaining to language development among young handicapped children. It was hoped that the findings of these studies would be useful in helping the Bureau define and prioritize future long term research priorities in the area of language development, as well as to identify more specific short term research work that would contribute to these programmatic thrusts.

The Bureau therefore supported a conference specifically designed to analyze the findings and recommendations of these studies, and to analyze and synthesize researchers' recommendations for future research. The goals and objectives of this conference are described in a concept paper circulated to participants prior to the conference; it appears as Appendix A. A contract was awarded to Rehab Group Inc. to manage and report the proceedings of this conference. This document is the final report of the conference proceedings.

A. Brief Description of the Conference

Key conference participants included the Project Directors of the three language studies supported by the Bureau, as well as several other researchers in the area of language development of the handicapped. The latter were asked to critique the findings of the studies, and to add their perspective on recommended research priorities for the Bureau. In addition, Bureau personnel and several Rehab Group, Inc. personnel were in attendance. A list of researchers who were in attendance appears as Appendix B.

The conference was two days in length. During the first day, Project Directors of the three BEH-funded language studies presented summaries of the findings of their work. The conference group discussed these findings, their implications for research, and compared various approaches taken. Commonalities in findings were identified.

During the second day of the conference, the Project Directors were asked to present their recommendations for future short and long term research to the Bureau. Additional recommendations were made by the other researchers included in the conference. An agenda for the conference appears as Appendix C.

B. Purpose and Contents of the Report

It is the purpose of this document to report conference proceedings. So that we could ensure as much validity as possible in our report, the conference was taped. Highlights of the transcriptions of these tapes appear as Appendix D. The reader is advised to read through the transcriptions, and identify each recommendation or suggestions regarding future research, for there are many of them.

We have also summarized the conference proceedings in a briefer form; this summary is the subject of Section II of this report.

So that this report would be of maximum benefit to the Bureau, we also have commented editorially on the conference, and have identified a series of possible long term programmatic research areas that the Bureau might support, together with a number of suggestions for short term research. These can be found in Section III of the report.

Each of the three language studies supported by BEH contained a series of recommendations for research. While these are available only for one study at this point, they should be included in this document when available in Appendix E.

II. SUMMARY OF CONFERENCE PROCEEDINGS

A. Introduction

The text below represents a point-by-point summary of the conference discussion. Many of the detailed comments regarding each discussion point have been omitted; for these, the reader is referred to the tape highlights found in Appendix D.

The conference agenda (see Appendix C) was used to structure the proceedings of the meeting. However, the discussion was lively, and the different suggestions, comments, and background information presented resulted in a rather complex meeting flow. Consequently, for ease of reading, we have separated the flow of discussion points into general topical areas.

B. Summary of the Discussion of Findings of the Boston University Study

The subject of Menyuk's and Frazer's literature review was assessment instruments of normal/non-normal children. The objective of this work was to determine if a profile could be developed for a certain aspect of language (i.e., phonology, morphology, pragmatics, syntactics or sematics) that will allow us to determine 1) when does it first occur? 2) when does the average child have it? 3) when do all children have it? This data would assist in the design of assessment instruments without incorporating every aspect of language.

Menyuk and Frazer view the language acquisition data to be highly suspect with respect to reliability and validity. There is a body of literature

on "normals" but methodology, control, and quality of presentation are very different so the data cannot be compared. The "non-normal" literature is sketchy with respect to linguistic development. Therefore drawing profiles are not warranted.

A review of qualified, comprehensive language programs showed that data to substantiate their effects is simply lacking. It is especially critical to look at these programs in depth, for they are being used.

Results of a research project with language disabled children showed that children behaved differently depending upon the nature of the processing task, even though the structure of the knowledge of the task was the same. This has implications for the design of intervention programs, for if we know the characteristics of the way a child processes language, we can begin intervention at this level. Information regarding a child can therefore be used to develop language intervention programs. The study of processing is a particularly critical area for further research, and also is an especially critical area for the development of assessment instruments.

C. Summary of the Discussion of Findings of the University of Kansas

Review of the literature on objectives of Guess's work were: 1) the assessment of language-related skills of pre-linguistic children, 2) review of the literature on language acquisition and assessment in normal and handicapped children, 3) review of the literature on language intervention programs and procedures for language handicapped children, and 4) development and maintenance of a computer based storage and retrieval system for language literature.

Basic findings of the separately subcontracted literature reviews were described. Speech perception of pre-linguistic humans is a relatively unknown area; there is almost no information on speech perception of pre-linguistic handicapped children. New assessment tools are needed for assessing productive language skills, and a re-examination of infant language development (as well as perceptual and conceptual development) is needed. Hearing sensitivity can be tested at six months or older.

Review of literature regarding qualified intervention programs shows that data usable to substantiate the gains made by these programs is lacking. Content and procedures used by these programs should be reviewed, and since they are difficult to implement as written, programs to train care-givers in the use of qualified intervention programs should be encouraged.

The language literature retrieval system consists of some 3,000 entries. The system must be kept up-to-date and available if it is to prove useful to the field. Major componants of the system were described. Specific recommendations with respect to the Bureau's future support of this system should be delayed until after a thorough evaluation is completed by persons in the field, and until exact specifications regarding cost and maintenance is available.

D. Summary of the Discussion of Findings of the Peabody College Study

McLean's study was oriented toward the clinician as a user. The study was to process literature for clinicians, build it into a new model, and identify new variables and approaches that would increase the validity

and cohesiveness of intervention programs. In their view language intervention systems are inadequate in scope, for language is considerably more complex and integrative chan generally thought. It involves the integration of social-interpersonal variables, the physical environment, human interaction variables, and others.

The form of language intervention programs are very much an outgrowth of the theoretical underpinnings upon which they were based. As such, they are a product of polarized thinking and are reductionistic in nature. They tend to be inadequate in scope, richness and context, and do not give sufficient consideration to precursors.

Intervention programs should add more ecological variables, become more child (as opposed to adult) oriented. Systematic study of the environment (especially child-centered) should be encouraged so that we can determine how to manipulate it to suit the child's needs. In addition, we do not have an understanding of the communicative reality of the language of the handicapped, (i.e., the strategies kids use to communicate.)

Some specific findings were identified in the study that would seem to be productive in expanding the scope of language acquisition (especially with respect to generalization). [See McLean's final report for details ...ed] And there is a great deal of information from normal language learning that could be incorporated into intervention programs for the non-normal.

Since some children won't achieve language, a good basic behavioral repertoire may be all we can hope for. Language development as studied in other countries may provide valuable information in this area. Is the purpose of RFP (to seek out better ways of intervention) still valid? What do we advise the Bureau to do in light of our findings? Review of literature gave few answers. It is fragmented, and full of gaps, and has no systematic theoretical underpinnings.

E. Recommendations for Future Research from the Boston University Study

Menyuk's recommendations for further research were: (1) the development of testing procedures for linguistic competence from age 0-5, and (2) the study of the development of pragmatic abilities of handicapped children in home and school settings.

Highly verbal homes produce linguistically competent children. Study of these same variables should be made in the homes of handicapped children.

How handicapped children feel about communication interaction with parents and others also should be studied. A study should be made of the nature of the child/care-taken interaction in the classroom milieu and in a one-to-one situation with one objective to study the effect of the setting or this interaction. Ways that parents can establish a "program" in the home should also be studied. However, methodology is a problem for we don't have any systematic situation for looking at conversational interaction.

In-depth studies should be made of the development of language competencies. As an example, mothers present some intonational cues that children respond to at a very early age; these kinds of interactions should be studied between a child and a variety of kinds of care-givers at home and in school. Suggestions were made that Rosenfield's methodology may be useful in this area.

Pragmatic competence of normal versus handicapped children should be studied. One might use turn-taking as a focus, or use participant observers to explore the level (primitive versus sophisticated) of normal versus handicapped nursery school children.

To ensure design control, cross-sectional and longitudinal studies should be done in conjunction. Studies of this type may require pilot testing and development phases, and these should be supported.

F. Recommendations for Future Research from the University of Kansas Study

Dr. Guess fully supported those recommendations made by Cairns (see pages 54-57 in Appendix D). Studies of the acquisition process and intervention should be paired up. Some intervention programs are good, but more research should be done to identify the significant variables. Existing programs should be further devaluated, developed, and refined.

Further work that should be supported is the development of techniques for teaching imitation to difficult-to-teach children. This would involve

as a first step the identification of prerequisite skills for imitation training and the development of sequences for teaching these.

Research should be done in determining the correct symbol system to teach. There is concern, since alternative communication systems have begun to be popular, that we don't know where they are leading us.

G. Recommendations for Future Research from the Peabody College Study

We must look much more definitively at different handicapped populations with respect to acquisition of language aspects such as semantics, pragmatics, and referencing. We should also be looking at the qualitative aspects of the handicapped child's environment.

Intervention programs should be more ecological, should manage more variables, and should consider prerequisites in the cognitive, social, and psychological domains. We should, in addition, be looking for new variables to incorporate into these programs.

Until more is known about language precursors and prerequisites, appropriate prognoses will be difficult to make. For those children who cannot achieve language, increases in the child's interaction with his environment is an acceptable alternative. Behaviors should be encouraged that are productive to the child rather than behaviors that language researchers view as appropriate.

H. General Recommendations for Future Research

Language assessment procedures for the developmentally disabled must continue to be explored. Perhaps a study of processing would be an appropriate paradigm for assessing the behavior of children. (Marge)

We need to identify "today's reality" with respect to what kinds of intervention works. This involves consolidating information regarding best practices and identifying ways that information can be grouped and applied to get optimum effects.

There are no criteria for identifying best practices, therefore they cannot be identified with any reliability or validity, and cannot be supported or promulgated. It is difficult to guide the Bureau regarding research to be done, for we know so little. (Marge)

Professional capabilities and training of care-givers must be studied, together with the effect of this person on the application procedures.

One major focus for future research should be an application and characterization of the community in which the child lives. This would potentially lead to the discovery of ways that the community could change to incorporate the handicapped child.

Community intervention should also be encouraged for primary, secondary, and terciary prevention. There are ways that effective community efforts can contribute to the prevention of human behavior disorders of various

types. It is irregular for research programming only to be concerned with intervention; prevention research should be supported as well. This does not mean simply community education programs, but broader brush prevention efforts of various types. A prediction was made that further major research thrusts will be in prevention. (Marge)

Research teams should work together along a continuum of prevention-intervention and sum data and progress to form an "enlightened" intervention package, because piecemeal, isolated studies do not allow for construction of intervention strategies in a systematic, enlightened way.

There are three populations that are especially worrysome with respect to language: 1) the seriously spastic, 2) the profoundly deaf, and 3) the classical autistic. (Moores)

Deaf persons work more effectively with deaf children than hearing persons do, because they have more sensitivity regarding what the child is hearing and communicating. This is partially due to unique patterns of eye contact, and other selected sensitivities.

The autistic are worrysome because we are still not very far along in managing a 24 hour environment consistently. Other countries have used parent trainers effectively in this situation; perhaps their procedures should be studied. Research during service delivery should be stressed as a procedure for studies of 3-5 year olds.

The use of program announcements versus RFPs as a vehicle for soliciting research studies was discussed at length. Researchers pressed for program announcements in specific priority areas, for this allows researchers to plan studies that they are in fact ready to do. Problems in implementing the program announcement as a vehicle are: 1) system resistance, 2) field readiness, 3) correspondence with Bureau priorities, and 4) integration of work into forward planning and objectives.

III. CONFERENCE SUMMARY AND RECOMMENDATIONS FOR RESEARCH

A. Editorial Comments on the Conference

Conference participants generally agreed that the review of literature in language development among handicapped children provided few answers to the field regarding best intervention practices. They also agreed that we know very little about the language development of these children, and that there is a great deal to find out. For this reason it was difficult for them to advise the Bureau regarding "where to start" with research; however, there was some agreement with respect to major research areas that are of concern.

Literally dozens of ideas for possible research studies can be identified in the audio tapes of conference proceedings. Probably because there is so much to be done, participants did not agree on one critically important research area of any specific project that should be funded. Consequently, no one well-developed recommended research project emerged from the conference, and there were relatively few comments to be found regarding specific methodologies or designs that should be used.

In fact, researchers suggested that they would hesitate to formulate such specific suggestions, indicating that researchers themselves should determine the specifics of the design through field initiated research. As we summarized the proceedings of the conference, we identified a number of priority areas for long term research that researchers recommend for consideration by the Bureau. These are as follows:

1. The Bureau should support work to study language acquisition among handicapped as well as normal children.

2. The Bureau should support work to develop and evaluate qualified language intervention programs.

3. The Bureau should support the design of reliable and valid assessment instruments for measuring linguistic competence.

4. The Bureau should support studies of care-giver/child interactions as applied to intervention or acquisition for normals as well as handicapped populations.

There were a number of suggestions regarding related areas for study:

1. Ecology as it relates to language acquisition and intervention.

2. The impact of P.L. 94-142 on service delivery.

3. Prevention of language disorders.

4. Study of inter and intra population differences among handicapped groups with respect to language development.

5. Maintenance of language literature retrieval system.

Finally, conference participants made a number of recommendations regarding research methodologies and procedures. These were as follows:

1. Control groups should be carefully constructed, to consist of different populations of handicapped and normal children.

2. Longitudinal and cross-sectional research should be combined.

3. Intervention and acquisition studies should be combined, so that they occur simultaneously.

In our view, the conference proceedings can be of most use to the Bureau in delineating long term programmatic research areas, in specifying some general study requirements, and in listing a variety of studies that could be arranged into a general research "program" with respect to language development of handicapped youth.

B. Recommended Area for Research: Language Acquisition and Care-Giver/Child Interactions

A basis for agreement among researchers was that studies of language acquisition among handicapped children should be supported by the Bureau. This is because design of effective intervention strategies must be in part based on this knowledge; it is also because development of prevention efforts is dependent upon it.

A long term programmatic effort in language acquisition of handicapped children must be comprised at least of the following:

1. Studies of prerequisites of language and compensatory mechanisms.
2. Studies of ecological variables involved in the acquisition process.
3. Studies of acquisition of various aspects of language.
4. Studies of acquisition in intervention and natural settings.
5. Study of alternatives to language acquisition, including symbol systems.
6. Study of population differences with respect to acquisition.
7. Study parent-child interactions as they relate to language acquisition.

Specific comments regarding language acquisition made by researchers follows:

> Parent-child interactions have been the subject of psycholinguistic research for some time, but have occasionally led to blind alleys (as an example, the finding that mothers tend to reduce and then repeat child's utterances at early ages). Future research in this area should be more ecological in nature, taking into consideration variables such as aspects of home background, the nature of the setting where the interaction takes place and so on.

Interactions (not necessarily all verbal) should be studied between parents and children with different handicapping conditions. As an example, it is likely that deaf parents may tend to do better in training for language acquisition with their deaf children than normal parents, for they tend to be more sensitive with respect to what children do and do not perceive and receive. This kind of research has implications for parent/care-taker training for dealing with special population children; perhaps, as an example, we should be thinking about how we can train parents to respond "non-normally" to non-normal children. But as a prerequisite, we need to study and define the relevant ecological variables, such as the care-taker's attitude toward the child.

Parent/teacher/care-taker interaction with the child is directly related to intervention strategies and, of course, to language acquisition. They go together, and the patterns of one may influence the nature of the other. We need to determine if there are generalizations across handicapped populations with respect to either or both. (Menyuk)

The nature of the environmental setting may influence the nature of parent/child interactions. As an example, there are differences between parent/child interactions in the one-on-one situation and the nursery school environment. In one-on-one, the child must quickly respond; in a nursery school setting, the child has many more cues with respect to how to make an appropriate response. (Menyuk) This appears to suggest that if the characteristics of the environment are different for handicapped children, that the nature of parent interactions may be different as well. This suggests a study to determine the precise nature of differences in several environments for handicapped and normal children, as well as examination of the nature of the difference between parent/child interactions of several groups of handicapped children.

Other variables in parent/child interaction that may vary with handicapped and normal youngsters are (1) the sex of the parent; fathers may be especially good with handicapped youngsters. (Menyuk) (2) Home background variables; parents of handicapped children may not have the same attitudes toward language acquisition as parents of normal youngsters. (Marge) Perhaps this can be trained for.

"Turn-taking" was suggested as one component of parent-child interactions that may be fruitful as the subject of a study between handicapped and normal children. No sophisticated methodology is required; one simply watches and charts the differences between the handicapped child and his mother, and the normal child and his mother.

Some patterns of turn-taking may be better at eliciting language behavior, or we may find that handicapped children take fewer turns, do not speak as often or as much, or initiate language as much of the time. (Menyuk) We also may be able to chart the influence of parent behavior on the performance of the child; for example, reduction in parent verbal and ancillary behavior may result in increases in the handicapped child's verbalizations.

Suggested studies concerning language acquisition and care-giver/child interactions:

One potential multi-faceted study is the examination of the characteristics of conversational interactions between different populations of children and their care-givers. This might involve study of the numbers of turns taken, number of initiations, numbers of verbalizations, and other measurable linguistic behaviors.

General Basic Testable Hypotheses for this Study are as follows:

1. If parent-teacher/child interaction patterns are different in specific respects for different groups of handicapped children, ... and

   If parent-teacher/child interaction patterns have implications for the design of home/school intervention programs ...

   Then the study of parent-teacher/child interaction patterns for different handicapped populations may suggest, and delineate specifics of, population-specific home-school intervention programs.

2. If home-school settings influence the nature and quality of the parent-teacher/child interaction, ... and

   If home-school settings are different in determinable ways for normal and different groups of handicapped children ... and

   If "best practices" for the home-school setting can be prescribed for these parent-teacher/child interactions ...

   Then we may design prescriptions for the home-school setting that will improve the quality of the parent-teacher/child interactions for each group of handicapped children.

The deaf is a particularly interesting population for a study of this type because a number of testable hypotheses regarding deaf/normal parent-child interactions suggest themselves. One is that the deaf parent more effectively trains her/his child in conversational interactions; this suggests that other parents can be trained to model these crucial behaviors.

Population possibilities: Normal care-givers with normal children, non-normal (deaf) care-givers with non-normal (deaf) children, normal care-givers with non-normal (deaf children).

Design specifications: Piloting and design phases should be included; study should include 0-5 year olds; research team should prepare the study design.

Other studies that were suggested by researchers are li[illegible] below:

- A study of imitation training. (Guess)
- A study of the prerequisites of language and compensatory mechanisms for their achievement, (including comprehension, production) by handicapped children. (McLean)
- A study of the development of pragmatic abilities of (handicapped) children from 0-5 in school and at home, using "normal" controls. (Menyuk)
- A study of the understanding of supersegmented cues versus code of handicapped versus normal children at early months of age. (Fraser)
- A study of home background variables with respect to how they affect language and education readiness for normal and handicapped populations, especially the attitude of parents regarding language. (Marge)
- A study of alternatives to language for non-linguistic children such as increases in interaction with the physical world. (McLean)
- Construction of better definitions of acquisition processes. (Bricker)
- A study of various characteristics that various populations of handicapped children bring to the language situation. (Marge)
- A study of language acquisition in naturalistic environments, and modification of the environment for the handicapped child. (Marge)

C. Recommended Area for Research: Intervention Strategies with Handicapped Children

Results of the literature reviews and other data showed little supporting data for qualified intervention programs, but programs are being used. Researchers agreed that the Bureau should support evaluation studies of qualified intervention programs, should invest in the study of ecological variables involved in intervention, and should stress the desirability of studying the language acquisition process within intervention program settings. The study of care-giver/child interactions are also a logical part of the study of intervention settings, as is the design and testing of assessment.

Specific comments regarding intervention strategies made by researchers follows:

> No best practices with respect to language intervention with handicapped children can currently be identified in the literature. (Menyuk/Fraser/Guess/Marge) The Bureau would not be advised to try to identify these unless supporting data is available or can be obtained. (Marge/Guess) Where this is possible, data should be consolidated, and ways should be identified to group and apply these. (Marge)
>
> It would be feasible to determine one or several language intervention programs currently in use and determine if their claims of success can be substantiated. It would be best to assume that small subcomponents of the program would be validated rather than the entire program itself, and it would also be productive to systematically search for the variables that are producing the gains. This should be a several year effort, and it is important work for the Bureau to undertake. (Guess)
>
> As part of the evaluation of language intervention programs, we must determine what proportion of the success of a given program is due to the unique interaction of the parent/teacher/care-giver and the child, and how much is due to the actual effects of the intervention system itself. Research to determine if language intervention strategies are "people proof" has never been formally attempted. We may determine that the "best" practices may not be teased out; we may only be able to say that a given practice is effective if used by a person with x characteristics. (Marge/Moores)

The interaction of intervention strategies and parent-teacher-caregiver/child interactions suggests the relationship between intervention strategies and teacher training issues. Intervention strategies can only succeed if teachers learn how to use them effectively, and if they are designed correctly.

Strategies should be designed so that they are concerned with concepts and domains of behavior rather than particulars of either. Consequently there is no particular that must be used as an antecedent and no particular that must be used as a consequence. The teacher must then be trained to sample around the concept, and make local adaptions. This suggests a project in teacher training, using a properly designed intervention strategy, and incorporating teacher individual differences as the dependent variable. Research to determine if intervention programs are used as written is possible as another research project. (Bricker)

Intervention programs must be studied with inter and intra populations of normals and various groups of handicapped youngsters. These should be more ecological, manage more variables, and consider more prerequisite behaviors. There should be fewer constraints on relatively basic research (especially with respect to prerequisites) that are productive and supplemental to intervention research, especially with respect to populations of handicapped youngsters. There is a need for more definitive work, especially for the profoundly deaf, the classic autistic, and the highly spastic. (McLean/Moores)

Other areas for study are semantics, pragmatics and referencing strategies as they exist in normals and handicapped populations. (McLean) Those research teams that are examining linguistic competence and pragmatic abilities (while running normal controls) should interact with the educational setting to suggest possible intervention strategies and then to evaluate these. Better definitions of the acquisition processes related to language are needed, as well as better ideas of probable acquisition sequences. (Bricker)

An important intervention research study is the process of selection of symbol forms to be taught handicapped children, since there is more and more emphasis on symbol forms other than speech. We're using these things, but we don't know where they are taking us. Variables that will help a teacher determine which system to use must be identified, so that changes in systems will not be frequent or disruptive. Can we, for example, motivate a child to change to a verbal language if he finds signing more efficient with respect to receiving and providing information?

Suggested studies concerning intervention strategies and "best practices":

- A study to consolidate available information regarding "best practices", including the identification of ways that this information can be grouped and applied for maximum effect of the application of procedures.

- A study of the efficiency of alternative symbol systems with different populations. Sequential drop-back procedures may be appropriate in studying this issue. (Guess/Moores/Bricker)

- A study of intervention strategies used in foreign societies with handicapped youngsters. (Marge)

- A study of prevention of handicapping conditions, including development of community education programs (and other prevention efforts). (Marge)

- The study should include teacher training for preventive mainstreaming and should involve the development of materials for prospective parents.

- A study of the home environment of highly precocious deaf children, including the characteristics of deaf parent/child interactions. (Moores)

- The development of procedures for parent training for consistency in parent-child interaction.

- A study to evaluate intervention strategies stemming from studies of linguistic competence and programmatic abilities in educational settings, using normal controls. (Menyuk)

- This study should also include a classification of attitudes and skills that the programs presume to teach, as well as analysis of information regarding skills and expertise required of instructors. (Marge)

- A study to provide training to care-givers in making local adaptions regarding members of behavior classes to be taught in one or more specific intervention programs. This would involve training in varying the ranges of specifics in these programs and other aspects of their use and study to determine if they were administered as written. (Bricker)

- A study of the selection of proper symbol systems to teach, including an identification of the decision factors involved in the choice. (Guess)

- A study of the effects of psychological and ecological variables on the child's interaction with the environment in intervention programs. (McLean)

D. Recommended Area for Research: Design of Assessment Instruments and Procedures

Despite the fact that assessment procedures are tools of language study rather than the subject of the work itself, their development is critical to the entire study of language acquisition and intervention, as well as to the validity of the research effort. The development of assessment procedures has suffered somewhat because of the reaction against standardized instruments and testing in general, but conference participants agreed that new emphasis must be placed upon their development. Existing instruments were criticized because of lack of inclusion of enough instances of concepts, lack of sufficient attention to ecological variables of various types, and sketchy reliability data.

Comments of researchers with respect to assessment instruments appear below:

- Observation in settings gives clues about language functioning. It allows one to determine which aspects of language kids are capable of understanding and carrying out. However, what they can't do cannot be identified unless assessment procedures exist as well. We need both techniques. (Menyuk)

- We must have some kind of assessment instruments that can be agreed upon by those testing handicapped children as an indication of progress from one step to another that would be a standard for determining if a child has reached a terminal state, i.e., as a basis for evaluation. We need to be sure that these instruments test around the periphery of a concept, for most of these just require one instance of a concept to be demonstrated. This may involve expansion of existing instruments, adaption of lab/research techniques to a standardized format. (Bricker)

- Inventories of behaviors in a given domain must be completed, so that they can be included in assessment instruments. (McLean)

- There are procedures for assessing the child's comprehension of relationships before he produces those relationships, as well as his ability to produce them. These procedures should be carefully controlled for morphology, etc. Then they should be standardized on a normal population before they can be used with children with developmental anomolies.

The Bureau must continue to explore assessment procedures as long as they are related to what takes place in a realistic setting. They should provide information about what you can do with the child.

Assessment procedures should include such components as the inter-rater agreement of behavior or non-behavior, enough instances of the same concept, and relative permanance of behavior.

Suggestions for specific studies regarding the development of assessment instruments and procedures:

- Procedures for testing linguistic competence from ages 0-5 should be standardized. This work should include expansion of existing instruments and procedures as well as the development of new procedures. The work should ensure the following:

    1. Establishment of inter-rater agreement on behavior/non-behavior.
    2. Multi-instance responses of each given domain of behavior.
    3. Specification of inventories of behaviors that are representative of given behavior domains.
    4. Inclusion of movement-oriented stimuli.
    5. Inclusion of normal control groups.
    6. Inclusion of a wide range of linguistic behavior.
    7. Related to natural home and school settings.

- Assessment procedures for infant speech production or comprehension should be developed and standardized on normal as well as handicapped populations. These should be controlled for morphology, etc.

- Assessment procedures should be developed for communication and interaction, should be applied across and within diagnostic classification, and should be standardized in natural settings.

APPENDIX A

CONCEPT PAPER CIRCULATED TO

PARTICIPANTS PRIOR TO CONFERENCE

BEH LANGUAGE CONFERENCE
CONCEPT PAPER

The Bureau of Education for the Handicapped has stated as one of its principal objectives:

> To secure the enrollment of preschool aged handicapped children in Federal, State, and local educational and day care programs.

This objective appears justified in that only a fraction of the handicapped children living today have had an opportunity to participate in preschool programs. There are relatively few settings where young handicapped children can obtain preschool education services. Therefore, the task before the Bureau is to facilitate the creation of preschool educational programs of high quality and to encourage parents of young handicapped children to enroll their children in these programs. Along with this problem is the corollary problem of determining ways to make preschool services more appropriate for the children. There are problems associated with the identification of preschool children with handicapping conditions and with determination of their individual needs. Related to these issues is the problem of getting information about innovative practices to programs so that practices can be continually improved. The importance of language development to early child development in general, and the importance of language deviations in handicapped populations in particular, is widely accepted by scientists and practitioners. Substantial data are available regarding both normal and deviant language development, as well as extensive material on procedures and aids for stimulating language development. The Education for the Handicapped Act authorized support of research relating to special educational problems of children who are mentally retarded, seriously emotionally disturbed, hearing impaired, visually impaired, speech impaired, crippled or otherwise health impaired, and learning disabled.

The mission of the Research Projects Branch in the Bureau of Education for the Handicapped is to assist in the improvement of educational opportunities for handicapped children through the support of research and research related activities. This support is directed at providing the information and resources necessary to increase the availability of appropriate educational opportunities for every handicapped child.

To accomplish its mission, the Research Projects Branch supports a wide variety of activities, including state-of-the-art reviews in particular areas of concern. Unlike most research and development activities, state-of-the-art reviews are generally limited to the collection and examination of already existing information and resources and, concurrently, the identification of gaps in information and resources.

In addition, the extent of available data and materials suggest that projects should emphasize the collation of data and adaptation of techniques and materials, rather than original research and development activities. This does not, however, exclude the limited development activities as a function of adapting techniques and materials or the collection of data in connection with the formative evaluation of emerging language training systems. It is also expected that project activities will concentrate on the characteristics, needs, and problems of infant and preschool handicapped groups, roughly birth through age five. However, inasmuch as even the most rudimentary language behavior may be delayed beyond age five in very severely handicapped children, applicants may wish to include consideration of initiating language behavior in somewhat older populations.

In 1974, three contracts were awarded to review and analyze available information and resources pertaining to language development among young handicapped children. These contracts were awarded to Boston University (Paula Menyuk and

Bruce Fraser), Kansas Neurological Institute - Topeka (Douglas Guess and Wayne Sailor), and Peabody College (James McLean). Currently each of the three projects is near completion.

Each of the three projects addressed, at a minimum, the following six tasks:

1) analysis of available data on language development,
2) analysis of available data on characteristics of handicapped children's language,
3) analysis of available techniques and materials for teaching language skills,
4) analysis of available instrumentation for assessing language skills,
5) definition of a comprehensive system for translating the results of these analyses into a form suitable for practical application, and
6) identification of further needed research and development activities.

Although each of the projects addressed the above work scope, the final reports are expected to differ because of the projects' different philosophical orientations and procedures. Given the probability of differences in their final reports, combined with the Bureau's need for planning future research and research related activities in the area of early language development, the Bureau feels that an analysis of the various findings and recommendations would be most timely. Therefore, the Research Projects Branch is conducting a conference to analyze and synthesize these projects' findings. While an important purpose of the conference is to permit a general exchange of information, the primary purpose shall be to discuss specific areas of agreement and disagreement in interpretation of the available information and resources, with particular emphasis given to analyzing and synthesizing the respective projects' recommendations for further research. The primary interest is to gain a logical and sequential listing of research and development activities that can be agreed upon to the extent possible and that

can be undertaken by the Research Projects Branch through its various support and procurement avenues.

It is anticipated that in addition to the language Project directors, up to three government (BEH) persons, four or five non-government persons, and an appropriate number of Rehab Group, Inc.'s staff will be in attendance at the conference.

APPENDIX B

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APPENDIX C

CONFERENCE AGENDA

BEH LANGUAGE CONFERENCE
Nov. 4 and 5, 1976

Day 1 -- Nov. 4

9:30-10:15 - Review and Analysis of Information and Resources Pertaining to Language Development Among Young Handicapped Children: Findings of the Boston University Study. Dr. Menyuk and Dr. Fraser.

10:15-11:00 - Discussion and Questions regarding Dr. Menyuk's and Dr. Fraser's Findings.

11:00-11:45 - Review and Analysis of Information and Resources Pertaining to Language Development Among Young Handicapped Children: Findings of the Kansas Neurological Institute Study. Dr. Guess and Dr. Sailor.

11:45-12:30 - Discussion and Questions regarding Dr. Guess's & Dr. Sailor's Findings.

12:30-1:30 - Lunch

1:30-2:15 - Review and Analysis of Information and Resources Pertaining to Language Development Among Young Handicapped Children: Findings of the Peabody College Study. Dr. McLean

2:15-3:00 - Discussion and questions regarding Dr. McLean's Findings

3:00-5:00 - Synthesis of Findings and Identification of Knowledge Gaps in Information and Resources: A General Discussion.

Day 2 -- Nov. 5

9:00-9:30 - Identification of Needed R&D Activities from the Boston University Study. Dr. Menyuk and Dr. Fraser.

9:30-10:00 - Identification of Needed R&D Activities from The Kansas Neurological Institute Study. Dr. Guess and Dr. Sailor.

10:00-10:30 - Identification of Needed R&D Activities from The Peabody College Study. Dr. McLean.

10:30-12:00 - Synthesis of Recommendations for Needed R&D Activities from the Three Studies. Group Discussion.

12:00-1:00 - Lunch

1:00-1:15 - Description of a Structure for a Sequential Listing of Future R&D Activities.

1:15-2:15 - Identification of Long Range Research Outcomes and Objectives. Group Discussion.

2:15-3:15 - Identification of Related, Sequential Short-Term Research and Development Activities: Group Discussion.

3:15-4:15 - Discussion of Recommendations for Proposed Objectives and Research Methodologies for Short Term R&D Activities: Group Discussion.

4:15-5:15 - The Production of a Sequential List of R&D Projects and Appropriate Methodologies: Formulation of Specific Recommendaitons to BEH. A Group "Paper and Pencil" Working Session.

APPENDIX D

HIGHLIGHTS OF THE DISCUSSION OF RESEARCH RECOMMENDATIONS TAKEN FROM AUDIO TAPES

Highlights of the Discussion
of Research Recommendations
Taken from Audio Tapes

29 - 30 How shall priorities be developed with respect to research funding? There is so much to be done and little money.

30 - 41 Is the purpose of the RFP (to identify better ways of intervention) still valid? (Marge) Review of literature did not give us very many answers; no best practices can be identified from literature. Was there any further study of these 'best practices'? We would not advise the Bureau to identify 'best practices' unless supporting data can be identified. (41)

44 With respect to providing guidance on what research should be funded, "We know so little, that its very hard to know where to begin".

63 - 69 (Menyuk) Recommendations for future research:

1. "Development of procedures to test linguistic competence from 0-5, i.e., to standardize available experimental procedures", and

2. "Study of the development of pragmatic abilities in handicapped children; (0-5), and overlapping developmental periods that one looks at with these groups in two settings; in the home and school."

3. "Those research teams that are examining linguistic competence and pragmatic abilities must interact with the educational setting in order to suggest possible intervention strategies, and to then evaluate those intervention strategies."

"And that we run normal controls on all of this (Fraser) to be compared to what others have found with normals. This will give us some confidence that we are looking at the same things as other researchers."

The paper that Menyuk submitted for the Princeton meeting could be used for specific suggestions regarding testing of procedures for testing linguistic competence from 0-5.

71 - 77 Experimental procedures should be studied regarding what is available in terms of analysis of speech perception and production during infancy. There are procedures for assessing the child's comprehension of relationships before the child produces those relationships, as well as his ability to produce them. Procedures should carefully control for morphology, etc. Then they must be standardized on a normal population before they can be used with children with developmental anomolies.

77 - 83 Kids who have language problems fail more in hearing the supersegmented cues than they do in the code itself, for they fail to appreciate the significance of intonation and the role it plays in communication. (Fraser) If we would find that they understand more of the code than we thought, but fail to communicate because of these aspects, that would say something about the intervention strategies to be used. Kids appreciate intonation contours very early. We need to know if there are kids who do not appreciate these at this time (i.e., several months). (Fraser)

85 - 89 There is no such phase as pre-linguistic. The early months of life are "indicative"; kids are sensitive to utterances and their intent within the first several months.

89 - 100 (description of graduate student research work)

101 - 102 The parents of handicapped children are a basis for "research", especially the nature of their affective interaction overtones.

104 - 109 "What is happening in interaction" between parent and child is important. With the language disorder, fathers were especially good. Perhaps fathers should be worked with regarding developing interactions.

110 - 123 Would it be useful to look at home background variables and how they affect maturation for language and education? Would this relate to kind of home variables that we find with handicapped children? (Marge) How can we help parents of handicapped have the same attitudes with language as parents or normals?

126 - 132 There are great differences between the 1 on 1 situation vs. nursery school environment. In 1 on 1, the child must quickly respond; in a nursery school setting, the child has many more cues with respect to how to make an appropriate response. (Menyuk) This is all part of examining these settings. Some work has been done: See Elliott Michler's response regarding what occurs in a regular classroom of first graders and teachers.

133 - 134 We must identify ways in which parents may establish a program in the home. (Marge)

136 - 140 'Turn-taking' occurs from birth. We should explore the difference between normal and language impaired children. Some patterns of turn-taking may be better at eliciting language behavior. The number of times a child had a turn may be less for language impaired children.

141 - 166 We cannot build a design that will tell us anything about 'turn-taking', for methods for analyzing conversational interactions are not there. (Frazer) (Disagreement) It is hard to do.

(See Rosenfeld's work) But should be looked at, simply to chart differences between the handicapped child and his mother, and the normal child and his mother. It is possible to research specifics such as 'turn-taking', but with the whole environment, it is very time consuming.

181 - 182 Is it the case that a child with a language problem does not speak as often, as much, take turns as often, initiate as often. (Menyuk) over time? Kids do differentiate between kids and adults with respect to the sophistication of their response.

199 - 201 We must identify those areas that need more longitudinal work than others. Perhaps we should identify these and prioritize them.

203 - 211 If language develops in patterns, then results of longitudinal and cross-sectional studies should correlate. We need a mixed design of these to ensure our results from longitudinal. First language acquisition studies show similar patterns of acquisition. Second language acquisition studies do not show these patterns. (Fraser) Since we have found this about second language acquisition, we must be careful about acquisition with non-normals.

213 - 215 P. O. 94-142 will not permit this kind of longitudinal work, so we must consider classroom intervention work. (Bricker)

215 - 232 Reducing parent's verbal and ancillary behavior resulted in increases in child's verbal behavior (with respect to improvement in performance), i.e., improvement of performance correlates with parent behavior. Parents can learn techniques in a few minutes. (American Journal of Mental Deficiency, Filler & Bricker - 4-5 months ago)

232 Perhaps we should be thinking about how parents can react "non-normally" to non-normal children. (Moores). As a prerequisite, we need to know exactly what is occurring in the home environment.

245 - 252 Caretaker attitudes toward children is a researchable area. Is it the case that there are generalizations across handicapped populations regarding interaction or intervention? (Menyuk)

255 - 266 Specific approaches to the answers to these questions must be designed by the specific research team. Start as early as possible (0-5). This requires a lot of time by a small research team. Piloting and design phases must be supported.

268 - 271 The study of language competence (0-5) should be designed around "processing".

293 (Guess) (See recommendations as written) There are many methodological considerations included. Many recommendations are designed toward specific populations. There is a lack of data to support intervention programs; yet we must intervene.

308 - 318 Variables that are producing gains must be ferretted out. We must support continued involvement and intervention; especially to support the evaluation of these projects. Longitudinal acquisition studies are important also.

320 - 322 Some recommendations listed would require all kinds of support; some a smaller amount.

Tape 2

(No monitoring numbers available)

What will give us the most insight into parent child interactions? A methodology is not immediately available, and nothing we know of would dictate a proper methodology for interaction studies.

Interactions are shifts in dynamics between parent and child. There is variation in the caretaker's behavior, depending on what cues are being presented by the child. There appears to be quite a bit of work being done by students in this area; care must be taken to ensure that there is no duplication. Both assessment and intervention should be explored.

It is feasible to identify 'successful' language intervention programs and to determine if they can substantiate their claims for success but this will require several years.

Small subcomponents within intervention programs should be validated, rather than the entire program itself. This is the method for reducing individual differences within a domain, showing that by reduction of those individual differences that the base is formed for the next acquisition stage in the process. There is some good data to show that behavior can be moved within a domain by this method. However, there is no particular which has to be taught, there is no particular which must be used as a consequence, and there is no particular which has to be used as an antecedent in that they are all members of a class that surrounds that form of behavior. That is the local adaption that the teacher or parent has to make. Whether the program is being used as written is another research question itself.

Teachers must stay away from specifics and must understand concepts that they are trying to obtain, the range of specifics, and how to vary them to give the child the best access to the relevant and irrelevant dimensions of a class. The teacher must understand that range and then select from local options members of that range. (Bricker) Such programs would tend to fail if tested at the 'particular' level against other programs.

The study of language intervention programs is being incorporated into teacher training programs so that teachers will be trained in the local adaption of the system constraints. If the student cannot do adaptions at the teacher-training-class abstract level, then he probably cannot manage the intervention at all.

TAPE 3

When do morphological aspects appear? We should be able to show acquisition patterns of different morphemes and one good study would be to chart morpheme with syntactic and semantic patterns. There is some overlap between, such that early instances of semantics may appear before final morphemes. How do you design an instrument that will provide profiles of what kids can and cannot do? All this was the basis for the literature review. The quality of language acquisition data is inadequate, and non-normal literature is poor with respect to acquisition data. Almost all of the assessment instruments are designed for standard score rather than profiles. Some in phonology were OK with respect to repetition. But there is really no adequate assessment, except that there were critiques by colleagues with respect to validity.

A reference was made to CLAM (Child Language Acquisition Measure) by Christie Ludlow.

Our objective in doing research was: (1) based on dissatisfaction with available assessment instruments, and (2) a brief review of programs showed lack of rationale to each language. Those that claimed one have no expression of it in the content of the program. There is a suspected central nervous system impaired population, average in IQ but possessing a language disability. Instruments should assess same processing knowledge across tasks. We used imitation and comprehension tasks (picture IQ/object manipulation) and correction and generation (picture stimulation) plus spontaneous verbalizations. The population consisted of 4 to 8 year olds, with an N of 20 who were mostly males. Medical histories and all related data were examined on the population.

Findings showed that in presumably a homogeneous population, kids behaved differently regarding the nature of the task (with the same structure). The particular processing tasks make a great amount of difference. Conclusions were: (1) that the population was not homogeneous; how each child responded needs to be provided to the language development program, (2) most assessment instruments that claim to look at functioning but don't deal with processing are not efficient, and do not address functioning. Clinicians can recognize this when it is pointed out to them.

Occasionally in the deaf there appears to be an intermediacy in linguistic structure, but this study will not explain these findings. Deaf kids make errors which indicate that they are making generalizations.

Selection of categories and assumptions indicates that information regarding the child can be used to develop a language intervention program. But application of the approach to actual instruction is rare. It explains; but it is not used for language acquisition tests. Tests are not valid unless translatable into intervention situations.

The whole issue of 'processing' is the concern. If we know how a child is doing this, then we can begin intervention at this level. Getting from the diagnosis to the specification of procedures is the issue. (Marge)

Processing aspects should be examined first. Is it now appropriate to construct a system for intervention? Have there been longitudinal linguistic studies of deaf kids over time and educational intervention with them? No. (Moore) But psychological aspects have been studied. The population categories we use are not functional with respect to language acquisition (in MR); maybe one of our first positions is that categories as used (MR, deaf, etc.) are not useful with respect to acquisition. It is more important to identify behavior according to relevant categories. Real variables that reflect heterogeneity with respect to language must be identified (such as processing).

Doug Guess --

1) Review of literature regarding communication deficits of handicapped children.

2) Computer program for language acquisition literature retrieval.

3) Several subcontractors were involved. Butterfield and Cairns' review of literature of communication problems in infants prelinguistic program, procedure, and techniques for detection. Longhurst identified and classified assessment instruments from first word on.

Guess himself identified intervention program for children with handicapping conditions. A retrieval system was designed for the literature reviews from the three sites. It includes 3,000 entries: (1) prelinguistic assessment and intervention; (2) linguistic development and assessment; and (3) language intervention programs and procedures. For each entry, there is descriptive information regarding population, age, and classification according to various categories, such as instruction setting, etc., identification of level and type of training of investigator. Some were abstracted, especially those with most significant findings. Cost analysis for requests amounts is $25.00 for search, and 75¢ for mailing.

The group should try the system out; and then recommend to BEH whether the system should be maintained.

Experimental literature shows normal infants selectively respond to speech. We know little of speech perception; the literature is largely silent regarding how abnormal infants respond to speech as reinforcers.

Assessment of productive language skills (i.e., the amount of time an infant spends vocalizing) shows very little research regarding perceptual and conceptual processes. There is very little relation between cognitive and linguistic performers. The project approach in the study of perceptual and conceptual precursors is important.

If you review Morse's discussion of acoustic perception and Hayse's regarding visual perception, you might get a payoff. (Menyuk). Accomplishments are dependent on processing times the factor of the strategies used in processing. Identification of non-verbal interactions that are inferred from non-verbal behavior is a purpose of Piaget. Production is pre-linguistic, cognitive styles and ecological variables are involved in semantics.

Review of literature on normal language development appears to be overlapped with Menyuk's work.

Pragmatics might be defined as how is what I said modified by the context in which I said it.

Conversational speech is a problem area with respect to investigation. It is a problem to define; language intervention programs have been teaching an aspect of language; it is taught within the context of a training situation. We need to look at teaching language in other situations beside the laboratory, i.e., in non-training environments.

Were follow-up studies designed? (i.e., was a time lapse system used?) How well child is using skills taught in other settings is basic evaluation criteria.

Review of qualified, comprehensive language training programs shows that data to substantiate these programs is lacking. Behavioral programs are difficult to implement as written, for nuances cannot be written. There is a need to make these "people-proof".

If you look at the intervention issue as a clinician, the theories are too reductionistic to generate intervention systems of adequate scope, so we may want to extend the theoretical bases slightly. This is already being done to some degree in semantics.

The Peabody group proposed to process new literature for clinicians and build it into a new model which is different from transformational or behavioral theories and also to

identify new variables and new approaches which would increase validity and cohesiveness. This work concentrated on young, severely language deficient children.

The work contains contrastive statements to previously held positions. It does not negate previous work; but it addresses voids. There is insufficient appreciation that language is a constructive behavior involving cognitive, behavioral and social domains. Constructive is defined as integrative. The child interacts actively with the environment; there is consequently more expectation of activity on the part of the child than in previous "pre-wiring" theoretical approaches. Language is a product of a number of human systems and is a lot more complex and integrative than either the behavioral or "pre-wiring" approaches. Language should not be viewed as a different class of behaviors between normal and abnormal populations.

There is currently a poor representation of what might be optimal environments, for they are not rich and broad enough. The kinds of inputs must be expanded. Variables that are in the literature should be pulled out and plugged into a model.

Lots of new work is not represented in language programs. We need to examine the child's reality of the language 'world', for they may not look at the world the way we do. We need to examine these issues for the handicapped, and then incorporate these into language programs.

It is important to see how non-linguistic analogues are processed for these kids.

Most intervention programs are adult centers as opposed to child centers with respect to determining relevant variables and designing programming; we must design environments that will enhance language development, and this will necessitate researching the language process through the child's eyes.

TAPE 5

0 - 8 The sensory motor curriculum has not been disseminated because teachers cannot be talked away from use of specifics. They do not understand the range of local options that can be used, so the curriculum would fail at the particular level. We must train the personnel to use the materials and experimentally validate them. This is where research money can be used. Teams of researchers should be utilized.

8 - 20 Programmatic research is characterized by long term goals and funding possibilities and a problem or class of problems. There is usually a multi-disciplinary research team. It is schematic and interdisciplinary. There is not the same concern with each step along the way; there is a multitude of products, rather than simply one product of single studies.

20 - 37 Definition of longitudinal problems. There are administrative constraints on how long projects can last. There are situations where people are forced to compete; long term interdisciplinary research helps prevent this. Cost benefit analysis has not been done in language acquisition research; we must know that it will be economically feasible for language acquisition to occur (Bricker) and that state and local government could and would support it. Is longitudinal research allowable? (i.e., one grantee with several subcontractors?)

37 - 43 Specific areas for research: (Guess)

1. Need to explore imitation training.

2. Selection of the type of language (symbol) systems to teach.

There is much emphasis on symbol forms other than speech. These must be explored and decision factors that are involved must be identified.

73 - 91 Intervention programs must go on; we must identify areas that have high potential for use. One is inter and intra population differences between normal and handicapped children and there is interest in psychological realities regarding normals and handicapped kids. There is need for much more definitive work regarding handicapped populations.

73 - 91 Data itself is important, rather than the design characteristics for this allows "mining". There are a lot of variables regarding interaction with environment and the influence of the "care taker", such as psychological variables of communication per se, and ecological variables. Some of these "new variables" should be tested out within intervention programs. Intervention studies should be more ecological, should manage more variables, should look more at prerequisite behaviors. The continuum has been shewed toward very product-oriented applied research; we need more acceptance or a little less constraint on initial, relatively basic research that is productive and supplemental to intervention research.

96 - 100 Adult-child interactions and pragmatics should be studied. Field initiated work will allow for self-determination of priorities.

100 - 108 We owe a lot to basic psychological research. As we look at supplemental research programs, most are funded by NIMH, but NIMH will not fund studies to apply the basics to handicapped. This should be BEH's responsibility. Constraints regarding product orientation must be reduced with respect to this application.

113 - 122 Until we know more about precursors or prerequisites of language communication, we won't be able to make realistic prognoses. For kids who have no basis for language, we might be able to increase interaction with the physical world. If we can alter these interactions, perhaps this child may become a candidate for language. (McLean) There may be behaviors which are more realistic for a given child than language.

123 - 129 Much work is aimed toward compliance, i.e., adaptive behavior that we want that are not very child-oriented. A lot of interventions are setting up sequences of failure situations. Emphasis should be placed on accepting the child where he is. These are burning enough issues to 'direct' research.

143 - 151 Perhaps if one could determine what prerequisites are for language at a later stage of development. If these are not present, we might predict that the child won't achieve language. Clearly, some handicapped kids won't be engaging in some prerequisite behaviors (i.e., blind will not be doing some of the prerequisites to object identification) but some other prerequisites are engaged in. We therefore must be concerned with compensatory mechanisms. So prerequisites can't be considered without considering other means of achieving the same results. (Menyuk) Comprehension must be addressed, as well as production.

155 - 162 Program description.

163 - 165 (directions to react to specific recommendations by non-contractors)

165 - 177 (Bricker) I concur with need for better definition of acquisition processes that are related to language. We need better ideas of probable sequences, and more cooperation between researches with respect to formulation of operational definitions. We've had a tendancy against Standardized Instruments but we must have some kind of assessment instruments that can be agreed upon by those testing handicapped children as an indication of progress from 1 step to another that would be standard for determining if a child has achieved a terminal state, i.e., as a basis for evaluation.

178 - 182 We need to test around the periphery of concept rather than just to elicit one instance of it, and most instruments test only for one instance. Many involve the expansion of existing instruments or the adaption of lab/research techniques to a standardized format.

183 - 185 Lots of lingustic behaviors are not well represented in existing assessment instruments. Inventories of behaviors in a given domain must be done, so that they can be included in assessment and instrumentation. (McLean). Instruments should represent a more language - specific scope.

185 - 190 (Menuyk) Observing in natural settings gives clues about language functioning. In case of pragmatics, you can determine which aspects children are capable of understanding and carrying out, but you won't find out what they can't handle unless you have assessment procedures as well.

193 - 196 We might require action to be included in the stimulus materials themselves.

197 - 214 (Moores) Few think that a "pure" approach (either behavioral or transformational grammar) will solve all our problems. We are more concerned with the interaction of the child with environment and how the environment impinges on the child. There is a consensus: 1) that we need to know more about naturalistic settings i.e., comprehensive knowledge of environment and the child, 2) that we must study to modify environment for kids who aren't normal and how to set goals for them, 3) unless language is defined for all encompassing, we won't be looking at it in isolation. There must be much more emphasis on whole child. The child's language functioning to a large degree can be

197 - 214 predicated on his intellectual/cognitive development, but there are those who are normal with respect to intellectual and cognitive functioning yet still can't achieve language. Intellectual and cognitive functioning may be a prerequisite, but not a sufficient condition.

222 Operational definition may be defined as conditions that must occur to infer that a process is happening.(Bricker)

234 (Marge) Bureau must continue to explore language assessment procedures as long as they are related to what takes place in a realistic setting in school, or at home. It must provide information about what we can do with the handicapped child. We need to consolidate information about best practices and identify ways that the information can be grouped and applied to get optimum effect of application of procedures. The information is available; we must analyze it appropriately for application. While we are talking about a language application process - we really mean a series of skills and attitudes that are applied in a number of settings. We need to assess these in turns of the application of procedures to child by care giver. We must determine how much of the results is due to the unique interaction with the child and how much is due to the actual effects of procedures. We've never actually tested to determine if the systems are "people proof". We may not be able to tease out best practices; we may only be able to say that there are best practices if used by people with given characteristics.

238 We must be more definitive with respect to what various groups of children are bringing to the language process. (deaf, blind, etc.)

273 - 276 We should consider the development of a research design which attempts to describe the multitude of variables that should be addressed over time. (Marge)

276 (Marge) We should consider the study of foreign societies and how the community handles the handicapped. We should look at the community environment which the child lives, to consider how we can change the community to incorporate the child, as other societies have done. This may involve changing the attitude of individuals toward handicapped.

TAPE 5 (Part 2)

01 - 09	Selecting the right kind of symbol systems to teach is a critical research area. We need to look at efficiency of symbol systems and what are variables that may help a teacher determine which system to use (Guess). We're using these things; we don't know where we are going with them.
10 - 12	The principal of sequential drop back (that is beginning with most natural behavior, and dropping back to artifical when we must) is a useful procedure for this kind of research.
13 - 15	We should be doing work in natural settings and then doing some contrasts on particular domains of development. A sort of lab or clinical model is a good way to get a repertoire started and then to generalize to a natural environment, or begin with natural setting and generalize it to other environments.
19 - 33	(McLean) Research should be skewed toward basic areas. Applied programs are important, but they are also consumers of more basic knowledge about the nature of language. We should look to knowledge bases that will serve the applied programs well. Most recommendations extend some theoretical postures that are apparent in existing trends. We are trying to extend our findings of overall language community.
33	Let us identify studies that have immediate potential for people to use. Inter-intra population differences between normal and handicapped with respect to certain defined variables are psychologically rare in language. What, why, how they talk about sematics, pragmatics and referencing strategies versus physchological realities as they exist in normals and handicapped populations. We need to study quantitative and qualitative representation in handicapped and normals, and we need to look more definitively at handicapped populations. We must assess real differences such as care giver/child intractions among different populations. The power lies in data itself; not in technology used to obtain it, for we have a lot to find out.
46 - 48	We don't know how handicapped kids interact with their environment.

48 - 52 We need to identify new theoretical variables and other basics incorporated in language intervention programs per se. This research will be more ecological, will manage more variables, and look more at pre-requisite behaviors.

52 - 54 We need less constraints on relatively basic research that is supplemental as a basis for applied research.

56 - 62 There are voids in psychological reality of language usage. Field initiated work should be stressed so we can see what field is ready to do in this area.
Commonalities: (Don)
1) movement toward ecological
2) consideration of things such as interaction, pragmatics, what have you
3) parent/child interaction

A lot of this would be addressed in field initiated proposals.

62 - 74 I am pleased at the scope of work going on. Lots has come out of basic NIH research, but they won't extend it to the handicapped. We need basic research regarding handicapped by BEH. NIH won't do basic comparative study. We need inter-population (multidisciplinary) comparisons.

74 - 78 Until we know more about language precursors, we'll have a hard time making realistic prognoses. We need to determine where there is no language, if we can increase interactive responses with the environment.

78 - 108 What about kids who can't do language? When should we stop intervening?

110 - 116 If one could determine what prerequisites are for language, at a later stage of development and if prerequisites aren't present, you might predict that they won't achieve language. Lots of populations won't be engaging in normal prerequisite behaviors, but they may acquire language by using compensatory behaviors, i.e., there may be other means to achieve the same results. This may even involve

116 - 126 technological devices. Many kids determine compensatory behaviors themselves.

130 - 141 (Bricker) We need better definitions of acquisition processes related to language, and better ideas of probable sequences. We need better operational definitions. We have been thinking against standardized instruments as an index of progress that would be accepted from one location to another. We must develop some for which there are inter-rater agreement of behavior/nonbehavior, enough instances of the same concept and relative permanance of behavior.

141 - 155 Most assessment procedures have single instance responses to a given domain of behavior. We need to test around the periphery of a concept, and that may involve expansion of existing instruments. Adaption of lab techniques should be made to a standardized format. Maybe we need to identify inventories of behavior that an representative of a given domain of behavior. (McLean).

155 - 158 There is a tendancy too often to not include movement-oriented stimuli.

161 - 177 (Don) Interaction of child with his environment (especially how the environment impinges on a child) is a critical research area, and naturalistic environments should be studied. A second area is the impact of 94-142. This law will be a disaster for some of these kids. Other research areas are how do we modify environments for handicapped? How do we determine goals for these kids?

We won't be looking at language or communication in isolation; we will be looking at a whole child in interaction with his environment. The child's language functioning can be predicated on his cognitive and intellectual functioning. When kids are deaf but have normal cognitive/intellectual functioning, and who don't develop their language normally, I don't know how that can be built on.

177 - 188 Intellectual/cognitive development is a necessary but not a sufficient condition, but this kind of functioning is loosely defined. We need to specify conditions that can be taken as evidence that something is happening.

202 - 220 Most tests are unrelated to therapy, classroom, home setting. (Marge). We need to provide information about what can be done with the child, and we need to assess "today's reality" of what works, i.e., identify best practices, grouped and applied, to get the maximum utility. Do procedures work because of an actual procedural effect, or because of the interaction of the person and the procedure? This has never been tested. Maybe we can't tease out "best practices", maybe we must say there are practices that are best when used by peoples with certain characteristics.

TAPE 6

01 - 07 The Bureau should consider the influence of the community on special education. (Marge). The Bureau should determine what other agencies are doing in this area, and determine what BEH could do about providing useful information to the community, and the public at large about ways that we could prevent the incidence of handicapping conditions before they occur. We are concerned with crisis intervention. We should be preventing the crisis.

08 - 16 Teacher training for preventitive mainstreaming is an important research area. BEH could develop strategies for providing information to prospective parents, and develop community efforts in prevention. BEH should be encouraged to use existing government agencies; we shouldn't dissipate our money in community-wide education when there is legislation that community look at itself regard special education concerns. (Rosenblaum). (Marge) We should be in the business of eliminating the condition. As an example, there is evidence that we can reduce the incidence of stuttering "if we could eliminate abnormal behavior so that we wouldn't have to do crisis intervention, that would be most hopeful
35 - 36 approach."

36 - 50 At this point, BEH has no mandate before age 3. (P. L. 94-142) and prevention work can best be done early. Our best knowledge indicates that we must start earlier than year 3. We need money for study of prerequisite conditions of language. Stopping BEH's mandate at age 3 is handicapping the education of many children.

51 - 52 No information is prepared for parents of retarded kids or other handicapped children.

65 - 70 (Marge) The pendulum will swing to prevention with respect to language acquisition, so this should be a long-term research priority.

70 - 78 Interaction between parent and child with handicapping conditions (Menyuk) and suggestions for specific training steps should be a focus of research.

86 - 87 We need to explore use of minor adversive consequences to language deficits. (Bricker)

90 - 96 The most troublesome populations with respect to language development are:

1) severely spastic child, i.e, cerebral palsied

2) profoundly deaf

3) classic autistic

100 A follow-up study should be done with deaf children who are precocious (Moores) to determine what kind of environment has produced such relatively high level functioning. Deaf parents may tend to do better than hearing parents with a deaf child, since they are more perceptive regarding what kids do receive/perceive what they don't.

124 - 129 How do you manage the 24 hour environment consistently with a child? It may require too much money and/or expertise to operationalize.

130 - 137 Parent training for consistency is critical, but constant, supporting interaction is also critical.

143 - 145 There is a great need for back-up care for kids, and the break-up of the family is frequent unless you have ancillary services.

145 - 148 How do you get services to kids outside of metropolitan area?

149 - 173 How can language research be conducted in a service delivery setting or atmosphere? How do you separate the language process from other developmental domains? It looks messy. Much like "setting of one" studies. Language laboratories are useful if you can define the problem systematically, but sometimes you need a "full environment" to identify all of the variables operating, so both labs and environments are useful.

173 - 198 We have developed a model which capitalizes on competence response classes in curriculum programming across various dimensions, such as language development, self help care, sensory motor development, and pre-academic skills. These are not looked at as isolated domains.

We are trying to determine responses about some level and across domains that are topographically similar. Teaching specific responses therefore has a certain commonality. One is therefore not tracking a sequence but a number of skills across a domain. It is difficult to identify responses that cut across different domains but are of the same response level, but this work is in progress.

204 How can one carry this out in a service setting?

209 - 211 Curriculum can't be separated from language interaction. (games without words - Furth)

224 - 232 How do you go about understanding the environment and about motivating kids to use a communication system (speech) that is less efficient for them than others (such as signing) (Menyuk). The modality of presentation is different and it has different effects; we must begin to explore these systematically (Don.)

FINAL TAPE

75 Maintenance of Guess's automated literature retrieval system is a perfect place for an RFP, for the task can be well defined.

0 - 3 The Bureau should be pressing for program announcements, indicating interest in proposals in certain defined areas. This is responsive to needs of researchers. The Bureau can be just as directive this way, and it would be hard to go RFP route on such open-ended issues. However, the program announcement is only as good as receptivity in the field.

14 - 16 We need to study a representative spread of issues, and we need more definitiveness in what we do look at. We're too broad. With respect to research design, constraints are needed. (McLean). Issues are broad; the research design can't be.

28 - 30 Can you write an RFP for the development of assessment procedures, techniques for looking at communication/ interaction and applying them to comparative populations and across diagnostic classifications and within those classifications in language developing children? (Menyuk)

31 - 33 (McLean) One alternative is to take areas such as specific populations of handicapped, developmental level, different kind of representation of nature of language and put these in the form of proposal evaluation criteria. This approach is very open ended and encourages calibration.

41 People in the field need to encourage field initiated research.

42 - 64 Field initiated studies may not be related enough to indicate which way we are going.

End

APPENDIX E

RECOMMENDATIONS FOR
RESEARCH OF BEH CONTRACTORS

Introduction

Each of the studies separately contracted by BEH consists partially of recommendations for future work that should be supported by the Bureau. For the reader's convenience, we have included recommendations of the University of Kansas study as Appendix E . Recommendations of the Boston University study and the Peabody College study are not yet available.

A. Methodological Recommendations

We were dismayed to discover how much of the research we reviewed fell short of the minimal requirements that experimental work must meet in order to be translated into practical assessment and intervention routines. The short-comings were not subtle. Few experimental investigations employed procedures that could yield meaningful results from individual children. Few experimental reports reported reliability estimates of their procedures, regardless of whether they were designed to yield meaningful information about individual infants. No investigator was concerned with the cost effectiveness of his procedures. These problems should not be perpetuated by the Bureau of Education for the Handicapped. Rather, we recommend that the Bureau:

1. Support only research whose procedures yield data that would support ~~clinical~~ Edu. decisions about individual infants;
2. Require reliability estimates for all procedures used in the research it supports;
3. Require evidence about the durability of individual differences in performance;
4. Require efforts to manipulate performance in order to determine whether the subject matters of supported research provide reasonable targets for intervention programs, and
5. Require cost effectiveness estimates that take into account per-child expenses and national incidence figures.

B. Substantive Recommendations

We believe that the three substantive areas of investigation that we have reviewed are all relevant to the goal of implementing and assessing effective language intervention programs, but the three fields are differentially developed. Payoffs will come more quickly in some than in others.

Thus, the time required to develop individually-reliable measures of hearing sensitivity would be very short if modest funding were made available in the form of contractual moneys. The principles are all known and only technological refinement is required. The development of good procedures for assessing speech perception are necessarily further away, since the basic understanding of perceptual mechanisms even among adults is far from complete. Moreover, there are no demonstrations that speech perception mechanisms differentiate developmentally delayed from normal children nor that perceptual capability predicts subsequent differences in language use. Least of all is known about general cognitive and perceptual factors that might underlie subsequent language development. The most promising approach in this area concerns the possibility that Piagetian scales of cognitive development may provide important information about subsequent language development and about who is ready to benefit from language training.

We are ignorant of the realities of the Bureau's research funding capabilities. If funds were unlimited, we would recommend the funding of a few, broad-ranging programs that studied receptive, productive and relevant cognitive factors simultaneously. But even unlimited funds might not permit this strategy to succeed, since few research settings could provide the range of expertise required. Moreover, the talents required would be extraordinary, and exceptionally-talented researchers may not yet be prepared to accept the discipline required of such mission-oriented research. Scientists still consider themselves more as individuals than as teams, and the broad-ranging strategy would require a team effort above all. Accordingly, we recommend support of more narrowly-circumscribed efforts in each of the three areas we have reviewed.

1. Receptive Language Processes

Following the model elaborated by Wilson (1976) and Lloyd (1976),

technological research should be conducted to permit individually-reliable assessment of hearing sensitivity. The techniques developed for this purpose should be readily adaptable to the assessment of speech perception, which would permit the determination of whether exceptional populations differ with respect to speech perception early in life. Determining whether they do should also be given a high priority.

2. Productive Language Processes

The groundwork has been laid by Irwin (1947a; 1947b, 1949) for a concerted effort to develop clinically-useful techniques of assessing pre-linguistic vocal behavior. To do that, we recommend that:

1. Rather than focusing on large numbers of infants and using standard psychometric methodology, a few normally developing infants should be studied longitudinally to carefully describe the sequence of vocal development.
2. This study should begin a few weeks after birth and extend past the age of talking so that a direct examination may be made of the relationship between early productions and later linguistic behavior.
3. A multi-level evaluation of production should be conducted so that direct comparisons among levels of analysis can be made. Measures of predictability and sensitivity should be compared.
4. Standardized scales of general development should be administered in order to examine the relationships between vocal behavior and general development.
5. Clear empirical criteria should be used to evaluate the sensitivity of the various testing strategies.
6. After the preliminary study is completed, infants who are likely to be at risk for language delay should be tested in the same fashion, and compared to the normally developing infants.

3. Cognitive Underpinnings

The questions are whether the Piagetian cognitive scales differentiate delayed and normal children, and whether they strongly predict language development. Answering them requires testing Piagetian cognition and observing language development longitudinally in normal and disabled populations of children.

Conclusions and Recommendations

This chapter surveyed intervention procedures that are commonly used to teach speech and language prerequisites to language handicapped children. The survey suggests that relatively few prerequisite training procedures exist. Most of them are concerned with developing imitative behavior. The heavy emphasis on imitation training procedures probably reflects what is known and what is yet-to-be-known about speech and language prerequisites. There is some consensus that the ability to imitate is one of the important prelanguage prerequisites. How and where to program imitation training procedures remains an issue, as well as the need to identify and program "unknown" prerequisites. The research community (both theoretical and applied) needs to shift emphasis, not away from imitation entirely, but to include imitation procedures as part of a more global ecological process that encompasses the "yet-unknown" language prerequisites.

Several training strategies exist to bring about a generalized vocal imitative skill. Experience suggest that they all work for some children; however, it is also true that none works for some other children. The KNI laboratory has found that some children do not learn to imitate vocally even after years of training. These circumstances are not unique to KNI, and we, like other language research laboratories, must begin to take a closer look at why some children fail to imitate. We propose that there are several potentially useful areas of research that address this problem. Some will be identified below:

Response Functionality - Traditionally, most imitation training programs include such motor responses as "touch the table," "clap hands," "stand up," etc. These and similar responses have limited or no utility for the child in most situations. It can be hypothesized that responses such as these possess little intrinsic value, thus their teaching requires the use of additional artificial reinforcers.

Furthermore, these responses are not likely to occur frequently in the child's daily interactions within the more global ecological stimulus-response schemes. Functional responses, on the other hand, are those that have their own immediate (usually natural) consequences. Examples might include turning a radio knob in order to hear music, lifting a glass and drinking a refreshing liquid, etc. These observations suggest an avenue of research that identifies functional and naturally occurring responses that can be shaped and strengthened within the ecological stimulus-response scheme.

Reinforcer Specificity - Reinforcer specificity is inextricably encompassed in the above discussion; however, it lends itself to consideration in its own right. In the previous section, (a), the point was made that traditional imitation training procedures do not usually provide a reinforcing consequence specific to a particular response. That is, the consequence is the same (M & M, chips, etc.) for many responses that are to be brought under imitative control. It is possible that more rapid discrimination learning would occur if specific reinforcers were delivered for a specific imitative response. Instead of delivering an M & M each time the child attempts to imitate /Ba/ and /eat/, a consequence specific to each imitation might be provided (i.e., a ball to play with for /BA/ and food with /eat/).

Response Selectivity - Many language theorists believe that the child's spontaneous vocal repertoire indicates the best initial selection of vocal stimuli for training for that particular child. This implies that an assessment be made of the way the child is behaving vocally in his natural environment. Suppose that the child was heard to spontaneously vocalize the phonemes /KU/ and /BO/ instead of those suggested above (in b). These sounds, then, might be selected for imitation training, assigned reinforcers specific to each response (i.e., KOOL-ADE for /KU/ and a toy boat for /BO/ which, by design, provides each sound

with a function. This strategy provides an alternative to traditional imitation training procedures which might enable previously failing children to succeed.

Data on speech and language development in normal children have shown that children (as young as a few months of age) are capable of making subtle auditory discriminations. As they grow, the opportunity to practice discriminating, or processing auditory stimuli consumes a considerable portion of their waking hours. For the severely or profoundly retarded child, this ability might not be present. The extent to which "auditory discrimination practice" is a necessary prerequisite for an imitative repertoire to develop needs to be documented, and procedures (probably based on operant audiometry) should be designed to ensure that auditory discrimination training is provided.

The importance of Piaget's sensorimotor period in the language prerequisite process warrants a more thorough analysis. It has been suggested (Bricker, et al., 1975) that language is interrelated and dependent upon the development of other complex skills such as are observed to exist during sensorimotor period.

It has been generally agreed that the sooner a debilitating condition is identified in infants, the greater the prognosis for success. Reliable assessment procedures that identify language deviance in infancy must be found before the existing technology can provide a mediational program for this population.

The "speak-only-when-spoken-to" phenomenon might operate as a debilitating discriminative stimulus when language mediation is considered in a global sense. This phenomenon might exist because language training programs have typically programmed training sequentially rather than concurrently. Researchers and practitioners need to look more closely at the language user's total environment and commense training in such a way that more closely approximates that environment.

enhance the desired treatment outcome in a way which not only benefits the children undergoing treatment, but has also provided documentation which allows replication of the procedures used and, ultimately, a better understanding of language acquisition.

At best, however, one can conclude that the past decade has only produced the beginnings of a technology for the remediation and development of speech and language among handicapped children. There remains a number of unanswered questions which need attention in future research--investigations which must necessarily lead to answers to more basic questions before comprehensive language programs can be developed which meet the many needs of speech handicapped children. (The next chapter is devoted to the current status of existing comprehensive programs; some of which have evolved from the procedures, techniques, and results of studies reviewed in this chapter.) Some of the areas perceived as being important to subsequent research endeavors are summarized below.

Research Recommendations

1. Semantic Development. This is one of the key areas in need of considerably more research. Basically, little is known about the procedures used to teach basic referents to children who are absent in these skills. A critical issue is the need for the development of procedures to teach referents which have appropriate functional usage (meaning) for the child.

1.1. Research in semantic development should be addressed to the issues of relevant versus irrelevant stimulus cues, the role of mediated responses (e.g., motor responses), the contribution of reinforcer specificity in reference labeling, as well as more organismic variables such as subject population differences, age, etc.

1.2. The broader issue of reference acquisition as a function of training in either the productive or receptive modalities needs to be further researched.

The basic question is whether training in either modality facilitates acquisition in the other modality or whether each is functionally independent of the other.

2. Morphological Development. The acquisition of morphological grammar has received considerable attention from researchers. In sum, the technology is now available to teach rules of morphological grammar to handicapped children who, prior to training, do not exhibit the use of various morphological forms.

2.1. Subsequent research should address itself to the problem of measuring the trained morphological rules in the child's normal verbal interaction with the environment, and in developing generalization training procedures to be used when generalization does not occur. Research has sufficiently demonstrated that, if properly programmed in training, children's language behavior can be made to generalize to non-trained exemplars of the trained rule. It has yet to be determined, however, that these rules are used in appropriate conversational speech as a direct result of the intervention effort.

2.2. Additional research should also concentrate on the efficiency between concurrent and serial training procedures in the development of morphological rules within linguistic classes. The basic question is whether "overgeneralization" of the trained rules can be reduced by concurrent training procedures which treat allomorphs as a single linguistic behavior with different phonologically conditioned surface manifestations.

3. Syntactical Development. There have been relatively few studies directed towards the experimental analysis of syntax among handicapped children. Likely, this is in part due to the emergence of more comprehensive language training programs where syntax is taught as one component of a larger intervention effort. There are, however, several issues central to the development of syntax where further research is desired.

3.1. Research to date had indicated the important role of modeling in the acquisition of syntactical rules. More data are needed to evaluate the effects of modeling alone, or modeling in combination with differential reinforcement in response acquisition. This type of research should necessarily take into consideration the existing level of syntactical development in the subject population with the strong possibility that both modeling and differential reinforcement are necessary for children who have yet to acquire syntax beyond a rudimentary level.

3.2. Further research is most needed in directly analyzing the results of syntax training procedures in the non-training environment and under normal conversational conditions.

4. Conversational Speech. Conversational speech, like syntax, is often assumed to be a direct product of comprehensive speech and language training programs. For some children, however, direct and systematic training in conversational and spontaneous speech will likely be required. Essentially, there is little experimental literature available in this area.

4.1. Further research and program development are needed to identify specific procedures for teaching conversational speech to many handicapped children. The major consideration is whether the conversational speech usage is appropriate to the environment where the child resides.

4.2. Research is needed to assess and measure the influence of various socio-ecological variables on the acquisition and maintenance of conversational speech. This would necessarily entail a large research effort to analyze conversational speech, or the absence thereof, in relation to the myriad of physical, psychological, and social events and properties available to the child.

5. Inappropriate Speech and Elective Mutism. Basically, the same research needs in the area of conversational speech can also be applied to inappropriate speech. These research recommendations include:

5.1. An analysis of training effects to non-training settings and persons; and the study of variables which influence the degree of generalization.

5.2. Investigations into the socio-ecological variables influencing both the development and maintenance of inappropriate speech, with primary emphasis on the establishment of speech and language environments which minimize the reinforcing consequences for the use of inappropriate speech. Likely, a careful analysis of socio-ecological factors which accelerate appropriate conversational speech will be found incompatible with the type of environment which encourages inappropriate speech.

issues concerning language development would be reduced considerably. Until they become available, the theoretical and methodological issues that began to emerge during the 1960's will persist.

Summary Recommendations

1. Although all of the comprehensive speech and language intervention strategies reviewed in this section appear to be potentially effective, none has published data to document this effectiveness. Evidence showing that a modest speech and language repertoire can be developed in severely handicapped children has come from the experimental laboratory. These data were derived under stringent environmental conditions and most often by highly skilled technicians. The need exists to show that (1) the comprehensive programs as offered actually remediate language behavior and (2) the programs can be understood and effectively administered by paraprofessional personnel. All further observations will be offered relative to the one made here.

2. Rightly or wrongly, comprehensive language programs have made one fundamental assumption: That many highly specific and unique language training procedures (developed in the laboratory with single subjects) can be strung together to form a workable intervention curriculum. That is, if it has been shown that Child A can be taught to label actions when procedure X is used, and Child B can be taught to ask questions by using procedure Y, and Child C can be taught to label objects through procedure Z, then, Child D can be taught all of these things by sequencing procedures X-Y-Z. It is possible that there is an interferring interaction between language concepts that prevents the use of this programming logic.

3. The precise role that imitation training plays in the language remediation process remains unclear. Some language intervention strategies suggest that programming should not be heavily based on imitation procedures (Miller and

Yoder, 1974) while others do (Kent, 1974; Guess, Sailor, and Baer, 1976). It is possible that both approaches are equally successful. Only until No. 1 above is answered will the disagreement surrounding the role imitation plays in the language remediation process become clearer.

4. The language training milieu is rapidly developing as an issue in language training. Some programs emphasize the importance of highly structured settings where a one-to-one melieu exists; others, suggest that a less constrained instructional setting is best (as seen in the Bricker, Dennison, and Bricker [1975] model). This area needs to be extensively studied.

5. The efficiency of the language intervention process must be judged by how well it is able to teach generalized language use. Thus far, this has not been sufficiently done. NOTE: This issue is treated in detail elsewhere in this report.

6. It is generally agreed that the age of the candidate receiving language training may proved to be an important variable to be considered when selecting a language training strategy. Specifically, most practitioners suggest that intervention should begin as soon as it is possible to detect that a handicapping condition exists. However, there are no data to document that it is any easier to teach a four year old than it is to teach a ten year old, and more importantly, whether a specific procedure works with one group of children but not with another.

social developmental restrictions implicit in non-speech communication. In the case of the profoundly retarded, non-vocal child, only the very deaf and/or the very blind populations would seem to warrant exception from this rule.

Recommendations

1. Support research efforts leading to the identification of:

a) organismic variables requisite for generalized language usage

b) ecological variables requisite for generalized language usage

c) combinations of the two requisite for generalized language usage

Studies leading to the production of generalized language usage (from class or language training lab, to all settings) should receive a top research priority.

2. Research should examine success in training as a function of linguistic sequencing of training steps. Empirical support for a training sequence would allow program developers to concentrate on training methods rather than repeat previous errors in determining what to teach and when.

3. Research should be conducted which sheds light on the interaction of reception and production at early stages of language acquisition and later stages of functional language usage. Experiments on this subject should be closely related to the empirical efforts to establish training sequences, as outlined in 2 above.

4. Research is needed to provide empirical support for or against the "total communication" hypothesis--Can we replace imitation training as a precursor to speech and language training with signing or symbol systems (apart from perceptual impairments) as a motor-mediated facilitator of speech acquisition? This idea is being widely promulgated, but no data has been forthcoming.

SUMMARY OF SUGGESTIONS FOR FURTHER RESEARCH

(Supportative information and specific suggestions are found within the text.)

1. A linguistically oriented phonological description of speech of handicapped children is needed. Compton (1970) has described the speech of articulatory defective children of normal intelligence but none has been developed for mentally retarded, neurologically, emotionally, or acoustically handicapped children.
2. Because of problems of definition, classification etc. we do not have a good estimate of the incidence or prevalence of handicapped children, especially noninstitutionalized handicapped children. This is needed to facilitate program development and professional training. A national systematically organized and conducted investigation of the incidence and prevalence of handicapping conditions is needed.
3. There is little information available about the speech problems (stuttering, voice, articulation) of preschool-age children, especially within specific handicapping conditions such as mental retardation, acoustically handicapped, emotionally disturbed or neurologically handicapped.
4. We know very little about the relationship of speech problems to language problems in the preschool handicapped. If a child is not understood because of severe misarticulation difficulties, what is the relationship of this problem to his language development? What is the relationship between length, completeness, and grammatical complexity of sentences and articulatory ability in handicapped children?
5. The literature on morphological acquisition in mentally retarded children suggests that their sequence of acquisition of morphological skills and to some extent their ability to learn these rules in artificial situations may

be similar to nonretarded children. They seem to show a lesser ability to transfer or generalize morphological rules to new situations. This specific finding needs further investigation and we need to find out whether this phenomonon also is present in other areas of linguistic learning.

6. Research on the speech and language problem of children with hearing impairments of a relatively mild-moderate degree are almost nonexistent. These children have often gone unnoticed in the preschool years or later in the regular classroom and are just now being recognized. We need descriptions of their early language acquisition. We also need descriptions of early spontaneous language acquisition (signing) of deaf children with deaf parents. We know very little about the ultimate course of language development in handicapped children. Does the "delayed" child ultimately develop language skills consistent with peers?

7. The nature and the relationship of handicapped children's intellectual deficit and their verbal deficit needs to be further investigated.

8. There is a major assumption that has grown out of the study of normal language acquisition that competence grammars should be used for recording observations of performance. Should we follow this assumption with the handicapped? Dever (1971) and Engler, Hannah and Longhurst (1973) make alternate suggestions.

9. There is a real need for better descriptions of how different groups of handicapped children develops linguistically. What are the differences? What are the similarities? What are the explanations of the similarities and differences?

10. There is relatively little research on the communication development of handicapped children separate from their speech and language development.

11. There is a need for further investigation of language "deviant" children to see if their deviations are regular and appear to be rule governed.

SUMMARY OF SUGGESTIONS FOR FURTHER RESEARCH

(Supportative information and specific suggestions are found within the text.)

1. Methods of testing hearing acuity and auditory perceptual skills in severely handicapped or young "difficult to test" children developed by Fulton & Lloyd (1969) and other similar procedures need to be refined and made available to practicianers so that a wider population may be tested.
2. The promising approach to phonological assessment suggested by Compton (1970) and others needs to be developed and standardized so that it can be utilized more readily by clinicians.
3. There are few formal tests for assessing localization to a significant sound and auditory attention to that sound. Since these skills are very important to language handicapped children, more formal procedures that can be used by practicianers should be developed.
4. Better methods of "differential diagnosis" among specific handicapping classifications such as deaf and congenitally aphasic need to be further developed.
5. The validity of sampling in general and specifically the validity of standardized tests needs investigation. If a child scores correctly on a particular item on a standardized test will the structure tested necessarily be part of his productive system and vice versa?
6. Our conclusion is that decisions about utterance or sentence classification in spontaneous speech measures like DST, DSS, LASS and ISCD are difficult and sometimes arbitrary. What is the reliability of these decisions? What can we do to improve reliability?

7. There is a question of usefulness of particular procedures or tests. What is the reliability and validity of a particular measure of complexity when used for a specific purpose?

8. There is a tremendous need to standardize descriptions, measures and tests. Should utterances be measured in mean length in words or morphomes? Does it make a difference the way a sample is elicited? Does it make a difference how you segment a sample? Does it matter that a test standardized on normals is administered to handicapped children in three sessions rather than one? We need to develop better definitions. What is an utterance or sentence?

9. We need to know what measures correlate with what other measures. Why do some measures we assume are related only weakly correlate if they correlate at all?

10. Practicianers need research that compares the use of different assessment procedures or tests to help evaluate their relative strength or weaknesses.

11. There is a real need to develop methods of assessing interpersonal communication skills in children.